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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/748,862	12/28/2000	Satoshi Sakamoto	1076.1060(JDH)	6062

21171 7590 10/27/2004

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EXAMINER	
ALI, SYED J	

ART UNIT	PAPER NUMBER
2127	

DATE MAILED: 10/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/748,862	SAKAMOTO ET AL.	
	Examiner	Art Unit	
	Syed J Ali	2127	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 June 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-6,8-11 and 13-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-6,8-11 and 13-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the amendment filed June 30, 2004. Claims 1, 3-6, 8-11, and 13-15 are presented for examination.

2. The text of those sections of Title 35, U.S. code not included in this office action can be found in a prior office action.

Claim Rejections - 35 USC § 102

3. **Claims 1, 3-4, 11, and 13-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Sharma et al. (USPN 6,182,109) (hereinafter Sharma).**

4. As per claim 1, Sharma teaches the invention as claimed, including a method for controlling a plurality of threads that perform parallel processing, the method comprising:

monitoring a number of running threads performing parallel processing and a number of standby threads that are in a standby state (col. 21 line 60 - col. 22 line 4); and

comparing the number of the standby threads with a necessary number of the running threads at a predetermined time interval (col. 25 lines 45-65); and

terminating an amount of the standby threads exceeding the necessary number when the number of the standby threads is greater than the necessary number (col. 25 lines 45-65).

5. As per claim 3, Sharma teaches the invention as claimed, including the method according to claim 1, wherein the necessary number includes a maximum number of the running threads during a predetermined time period (col. 23 lines 32-38), and

wherein said comparing includes comparing the maximum number of the running threads and the number of the standby threads (col. 24 lines 53-65).

6. As per claim 4, Sharma teaches the invention as claimed, including the method according to claim 1, wherein the necessary number includes an average number of the number of the running threads during a predetermined time period (Claim 7), and

wherein said comparing includes comparing the average number of the running threads and the number of the standby threads (Claim 7).

7. As per claims 11 and 13-14, Sharma teaches the invention as claimed, including a computer readable storage medium storing a program for controlling a plurality of threads that perform parallel processing, wherein the program performs the method of claims 1 and 3-4 (Fig. 1).

Claim Rejections - 35 USC § 103

8. **Claim 5 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sharma.**

9. As per claim 5, Sharma does not specifically teach the method according to claim 1, wherein the necessary number includes a product obtained by multiplying the number

of the running threads during a predetermined time period by a predetermined coefficient, and

wherein said comparing compares the product and the number of the standby threads.

10. However, Sharma does allow for modification of the tests that determine whether to dynamically adjust the number of threads in the thread pool. Specifically, Sharma states that the specific conditional statements disclosed present one possible implementation, and that the system administrator can adjust them to suit precise needs. Furthermore, Sharma suggests the use of statistical analysis to control the adjustment of the thread pool (col. 26 lines 15-25). "Official Notice" is taken that it would have been obvious to one of ordinary skill in the art to use a multiplication coefficient to determine the necessary number of threads since the specific coefficient could be used to ensure that the necessary number suits the specific system. That is, a slower system may require a coefficient that results in a lower number of necessary threads, whereas a faster system would have more flexibility in the number of standby threads it could support. Additionally, the conditional tests in Sharma are not meant to be exhaustive, rather they are presented as example tests that could be used to carry out the general purpose of dynamic thread creation, and certain modifications therein would have been obvious to one of ordinary skill in the art.

11. As per claim 15, Sharma teaches the invention as claimed, including a computer readable storage medium storing a program for controlling a plurality of threads that

perform parallel processing, wherein the program performs the method of claim 5 (Fig. 1).

12. **Claims 6 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sharma in view of Torii (USPN 6,389,446).**

13. As per claim 6, Sharma teaches the invention as claimed, including a controller for controlling a plurality of threads that perform parallel processing, the controller comprising:

a server management thread for managing the plurality of threads based on stored thread information (col. 21 line 60 - col. 22 line 4), wherein the thread information includes a number of running threads performing parallel processing and a number of standby threads that are in a standby state (col. 23 lines 23-47);

a thread management circuit requesting thread generation based on the number of the standby threads, and requesting a standby thread to run (col. 23 line 55 - col. 23 line 2); and

a comparison circuit for comparing the number of the standby threads with a necessary number at a predetermined time interval; and (col. 25 lines 45-65).

a termination circuit terminating an amount of the standby threads exceeding the number when the number of the standby threads is greater than the necessary number (col. 25 lines 45-65)

14. Torii teaches the invention as claimed, including the following limitations not shown by Sharma:

a thread management table storing thread information of the plurality of threads (col. 6 lines 14-25).

15. It would have been obvious to one of ordinary skill in the art to combine Sharma with Torii since the thread manager of Sharma teaches the basic elements needed for managing a plurality of threads, but fails to specifically disclose how that data is represented on a computer system. A thread status table, or thread management table, for storing information related to each of the plurality of threads, as in Torii, would have been an obvious choice for a data structure that encapsulates information related to all the threads since all the necessary information could be contained in a single data structure. Thus, not only could the thread status table support thread creation and termination, but also information pertaining to the run status and other relationships could be expressed within the same data structure.

16. As per claim 8, Sharma teaches the invention as claimed, including the controller according to claim 6, wherein the necessary number is a maximum value of the running threads during a predetermined time period (col. 24 lines 53-65).

17. As per claim 9, Sharma teaches the invention as claimed, including the controller according to claim 6, wherein the necessary number is an average value of the running threads during a predetermined time period (Claim 7).

18. As per claim 10, Sharma does not specifically disclose the controller according to claim 6, wherein the necessary number is a product obtained by multiplying the number of the running threads during a predetermined time period by a predetermined coefficient.

19. "Official Notice" is taken that it would have been obvious to one of ordinary skill in the art to use a multiplication coefficient to determine the necessary number of threads for reasons discussed above in paragraph 10.

Response to Arguments

20. Applicant's arguments filed June 30, 2004 have been fully considered but they are not persuasive.

21. Applicant argues that in the claimed invention, "*the number of standby threads can be compared to the necessary number at points in time. When the number of standby threads exceeds the necessary number, the amount of standby threads exceeding the necessary number are terminated.*"

Applicant alleges that this contrasts Sharma in that "*Sharma et al. only discusses reducing a number of unused threads. In Sharma et al., if the amount of unused threads is greater than a minimum number of threads and a number of reserved threads is less than the minimum number of threads, then the number of threads in a pool is reduced by one. However, Sharma et al. do not discuss or suggest comparing the number of standby threads with a necessary number at a time interval, and does not discuss or suggest terminating an amount of the standby threads exceeding the necessary number, as recited in the pending independent claims.*"

22. Applicant's argument does not appear to reflect the specific claim language. As the argument is presented, Applicant states that at periodic intervals, the entire amount of standby threads exceeding the necessary number are terminated. However, the scope of independent claims 1, 6, and 11 is inconsistent with this allegation. The claim limitation in question specifically states: "**terminating an amount of the standby threads exceeding the necessary number when the number of the standby threads is greater than the necessary number.**" Specifically, the claim language of "**an amount...**" could be construed as "at least one". The limitation is broader in scope than Applicant's argument would suggest. Nonetheless, the method of reducing the number of standby threads taught by Sharma would terminate the entire amount of excess standby threads if enough time was provided. If the system activity is low for a period of time, i.e. several time slices pass by without an increase in activity, the number of standby threads would eventually return to the minimum threads value, which is the necessary number of threads required to service a typical load (col. 25 lines 45-65).

23. Applicant argues "*Torii describes a multi-processor system including a plurality of thread processors, but does not teach or suggest a comparison circuit and a termination circuit, as recited in independent claim 6.*"

24. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The portions of claim 6 that Applicant argues Torii fails to teach are not shown by the

teachings of Torii. Torii is cited as teaching a method of representing thread information in a thread management table. Sharma shows the claimed comparison circuit and termination circuit, as discussed above in paragraph 13.

Conclusion

25. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Syed J Ali whose telephone number is (571) 272-3769. The examiner can normally be reached on Mon-Fri 8-5:30, 2nd Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai T An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Syed Ali
October 21, 2004

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